

Sequence Listing

(1) GENERAL INFORMATION:

(i) APPLICANT: KAWASAKI, Hideki
TOKAI, Masaya
KIKUCHI, Yasuhiro
OUCHI, Kozo

(ii) TITLE OF INVENTION: DNA ENCODING PROTEIN COMPLEMENTING
YEAST
LOW TEMPERATURE-SENSITIVE FERMENTABILITY

(iii) NUMBER OF SEQUENCES: 2

(iv) CORRESPONDENCE ADDRESS:

(A) ADDRESSEE: FITZPATRICK, CELLA, HARPER & SCINTO
(B) STREET: 30 Rockefeller Plaza
(C) CITY: New York
(D) STATE: New York
(E) COUNTRY: U.S.A.
(F) ZIP: 10112-3801

(v) COMPUTER READABLE FORM:

(A) MEDIUM TYPE: Diskette - 3.50 inch, 1440 Kb storage.

(B) COMPUTER: IBM PS/V
(C) OPERATING SYSTEM: MS-DOS Ver3.30
(D) SOFTWARE: PATENT AID Ver1.0

(vi) CURRENT APPLICATION DATA:

(A) APPLICATION NUMBER: 08/894,344
(B) FILING DATE: 15-AUGUST-1997

(vii) PRIOR APPLICATION DATA:

(A) APPLICATION NUMBER: JP343700/95
(B) FILING DATE: 28-DECEMBER-1995
(A) APPLICATION NUMBER: PCT/JP96/03862
(B) FILING DATE: 27-DECEMBER-1996

(viii) ATTORNEY/AGENT INFORMATION:

(A) NAME: Perry, Lawrence S.
(B) REGISTRATION NUMBER: 31865



(ix) TELECOMMUNICATION INFORMATION:

(A) TELEPHONE: 212-218-2100

(B) TELEFAX: 212-218-2200

(2) INFORMATION FOR SEQ ID NO: 1 :

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 8874 base pairs

(B) TYPE: nucleic acid

(C) STRANDEDNESS: double

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: Genomic DNA

(vi) ORIGINAL SOURCE:

(A) ORGANISM: *Saccharomyces cerevisiae*

(B) STRAIN: X2180-1B

(ix) FEATURE:

(A) NAME/KEY: CDS

(B) LOCATION: 1 to 8874

(C) IDENTIFICATION METHOD: E

(ix) FEATURE:

(A) NAME/KEY: cleavage-site

(B) LOCATION: 1291 to 1296

(C) IDENTIFICATION METHOD: S

(ix) FEATURE:

(A) NAME/KEY: cleavage-site

(B) LOCATION: 4388 to 4393

(C) IDENTIFICATION METHOD: S

(ix) FEATURE:

(A) NAME/KEY: cleavage-site

(B) LOCATION: 5927 to 5032

(C) IDENTIFICATION METHOD: S

(ix) FEATURE:

(A) NAME/KEY: cleavage-site

(B) LOCATION: 7675 to 7680

(C) IDENTIFICATION METHOD: S

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 1

ATG GAA GCT ATT TCA CAA TTA CGT GGT GTT CCA TTG ACA CAC CAA AAG 48

GAC TTT AGC TGG GTC TTT TTA GTA GAT TGG ATT CTC ACG GTA GTA GTA	96
TGT TTG ACA ATG ATA TTC TAC ATG GGA AGA ATC TAT GCA TAC CTT GTA	144
AGT TTT ATA TTA GAA TGG CTA CTA TGG AAA CGA GCG AAA ATC AAG ATA	192
AAT GTT GAG ACA CTT CGT GTC TCC TTA CTA GGT GGT CGA ATA CAT TTT	240
AAA AAC CTT TCC GTA ATA CAC AAA GAT TAT ACA ATT TCG GTA TTA GAG	288
GGT AGT TTA ACA TGG AAA TAC TGG CTT TTA AAT TGC AGA AAA GCA GAA	336
TTG ATA GAG AAT AAC AAG TCT TCT TCT GGC AAA AAA GCA AAG CTT CCC	384
TGT AAA ATT TCC GTA GAA TGT GAA GGT CTA GAA ATT TTT ATT TAC AAC	432
AGA ACA GTG GCG TAC GAT AAT GTT ATA AAC TTA CTA TCA AAA GAT GAA	480
CGC GAT AAA TTT GAA AAA TAC CTT AAT GAG CAT TCT TTT CCT GAA CCT	528
TTT AGC GAT GGA AGT AGT GCT GAT AAA TTA GAT GAA GAT CTA AGC GAA	576
TCT GCA TAC ACA ACG AAC TCT GAT GCA TCA ATT GTT AAT GAC AGG GAC	624
TAC CAA GAA ACA GAT ATC GGC AAA CAT CCA AAG CTA CTG ATG TTT TTA	672
CCA ATT GAG CTT AAA TTT AGC CGC GGT TCC CTA CTG TTA GGA AAC AAA	720
TTC ACG CCA TCT GTT ATG ATT CTA AGT TAT GAA AGT GGA AAA GGC ATA	768
ATA GAT GTT TTA CCT CCA AAA GAG CGA TTA GAT TTA TAC AGA AAT AAA	816
ACA CAG ATG GAA TTC AAA AAC TTC GAA ATT TCT ATC AAA CAA AAT ATT	864
GGT TAC GAT GAT GCT ATT GGA TTG AAG TTT AAA ATA GAT AGA GGG AAA	912
GTG TCA AAG TTA TGG AAA ACG TTT GTA CGA GTC TTT CAG ATA GTA ACC	960
AAG CCT GTT GTA CCG AAA AAG ACT AAA AAA AGC GCA GGC ACA TCA GAT	1008
GAC AAT TTC TAT CAT AAA TGG AAA GGT TTA TCT CTT TAT AAG GCT TCT	1056
GCG GGC GAC GCT AAA GCA AGT GAT TTA GAT GAT GTT GAG TTC GAT TTG	1104
ACG AAC CAT GAA TAT GCT AAA TTT ACA TCA ATT TTA AAA TGC CCA AAG	1152

GTC ACA ATT GCA TAT GAC GTG GAT GTT CCG GGC GTT GTG CCA CAT GGT	1200
GCA CAT CCG ACA ATA CCT GAT ATT GAT GGA CCA GAT GTG GGC AAT AAC	1248
GGA GCA CCT CCA GAT TTT GCT TTA GAT GTT CAA ATT CAC GGA GGA TCC	1296
ATC TGT TAC GGA CCT TGG GCT CAA AGA CAA GTC AGT CAT CTA CAA AGA	1344
GTT CTA TCA CCG GTA GTT TCA AGG ACA GCC AAA CCT ATA AAA AAA CTC	1392
CCG CCA GGT TCT AGA AGA ATA TAT ACA CTT TTC AGG ATG AAT ATA TCA	1440
ATA ATG GAA GAT ACT ACT TGG CGT ATA CCG ACG AGG GAA AGT AGC AAA	1488
GAC CCC GAA TTT TTG AAA CAC TAC AAA GAA ACT AAT GAA GAA TAT AGG	1536
CCA TTT GGA TGG ATG GAT CTC CGA TTT TGT AAG GAC ACC TAT GCA AAT	1584
TTC AAT ATA AGT GTT TGT CCT ACA GTG CAA GGT TTT CAG AAT AAT TTC	1632
CAT GTT CAT TTC CTG GAA ACC GAA ATT AGG TCA AGT GTT AAT CAC GAT	1680
ATT TTG TTA AAA AGC AAG GTA TTC GAT ATT GAT GGG GAT ATT GGA TAT	1728
CCA TTG GGT TGG AAT AGC AAA GCT ATA TGG ATA ATT AAC ATG AAG TCA	1776
GAA CAA TTA GAG GCG TTT CTG CTA CGT GAG CAT ATA ACT TTA GTT GCA	1824
GAT ACG CTT TCA GAC TTT TCC GCT GGT GAT CCT ACG CCT TAC GAA CTT	1872
TTT AGA CCA TTC GTA TAC AAA GTC AAT TGG GAA ATG GAA GGA TAT TCC	1920
ATT TAC TTA AAC GTC AAT GAT CAC AAT ATT GTT AAC AAT CCG TTA GAT	1968
TTT AAC GAA AAC TGT TAT TTA TCC CTT CAT GGT GAT AAG CTT TCA ATT	2016
GAT GTC ACG GTA CCC CGT GAG AGT ATT TTG GGG ACA TAC ACA GAT ATG	2064
TCC TAC GAG ATC TCA ACT CCA ATG TTC AGA ATG ATG TTA AAT ACC CCC	2112
CCT TGG AAT ACA TTG AAC GAA TTC ATG AAA CAT AAA GAA GTG GGG AGA	2160
GCA TAC GAC TTT ACA ATT AAA GGT TCT TAC CTT CTC TAT TCC GAG TTA	2208
GAT ATT GAT AAT GTC GAT ACG CTA GTC ATA GAG TGT AAC AGC AAG AGT	2256

ACA	GTA	CTT	CAC	TGC	TAT	GGG	TTT	GTC	ATG	AGG	TAT	TTA	ACA	AAC	GTA	2304
AAG	ATG	AAT	TAC	TTC	GGT	GAA	TTT	TTT	AAT	TTT	GTG	ACG	TCA	GAA	GAG	2352
TAC	ACA	GGT	GTC	CTT	GGC	GCT	AGG	GAA	GTC	GGA	GAT	GTC	ACT	ACG	AAA	2400
AGC	TCG	GTG	GCA	GAT	TTG	GCA	TCT	ACT	GTA	GAT	TCA	GGG	TAC	CAA	AAT	2448
AGC	AGT	CTA	AAG	AAC	GAA	TCT	GAG	GAT	AAA	GGT	CCT	ATG	AAA	AGG	TCA	2496
GAT	TTG	AAA	AGG	ACT	ACC	AAC	GAA	ACT	GAT	ATT	TGG	TTC	ACA	TTT	TCG	2544
GTT	TGG	GAT	GGT	GCT	CTG	ATA	TTA	CCA	GAA	ACG	ATT	TAC	AGT	TTT	GAT	2592
CCA	TGC	ATT	GCA	CTA	CAT	TTT	GCC	GAA	CTT	GTA	GTG	GAT	TTC	AGA	AGT	2640
TGT	AAT	TAT	TAT	ATG	GAC	ATA	ATG	GCG	GTT	CTC	AAC	GGG	ACT	TCA	ATA	2688
AAG	CGG	CAC	GTT	TCA	AAA	CAA	ATA	AAT	GAA	GTA	TTT	GAT	TTT	ATA	CGT	2736
CGT	AAT	AAC	GGA	GCT	GAT	GAG	CAA	GAG	CAC	GGA	TTG	CTT	TCG	GAC	CTC	2784
ACC	ATT	CAT	GGA	CAT	AGA	ATG	TAT	GGA	TTA	CCA	CCC	ACA	GAA	CCT	ACC	2832
TAC	TTT	TGT	CAA	TGG	GAT	ATC	AAT	CTC	GGA	GAT	TTA	TGC	ATT	GAT	TCA	2880
GAT	ATT	GAA	TTT	ATA	AAG	GGA	TTC	TTT	AAT	TCC	TTT	TAT	AAG	ATA	GGT	2928
TTT	GGC	TAC	AAT	GAC	TTG	GAA	AAT	ATA	TTA	TTA	TAT	GAC	ACT	GAG	ACC	2976
ATT	AAT	GAT	ATG	ACC	TCG	CTA	ACC	GTG	CAC	GTT	GAA	AAA	ATA	AGA	ATA	3024
GGC	CTT	AAA	GAT	CCG	GTG	ATG	AAA	TCT	CAA	TCA	GTT	ATT	AGT	GCT	GAA	3072
TCG	ATA	TTG	TTT	ACT	TTG	ATC	GAC	TTT	GAA	AAC	GAA	AAA	TAT	TCA	CAA	3120
AGA	ATA	GAC	GTG	AAA	ATT	CCA	AAA	TTG	ACA	ATT	TCG	TTA	AAT	TGC	GTG	3168
ATG	GGC	GAT	GGC	GTA	GAC	ACA	TCA	TTT	CTC	AAA	TTC	GAA	ACA	AAA	TTA	3216
AGA	TTT	ACA	AAC	TTT	GAG	CAA	TAC	AAG	GAT	ATC	GAT	AAA	AAA	AGA	TCA	3264
GAA	CAA	CGC	AGA	TAT	ATA	ACA	ATA	CAC	GAT	TCA	CCC	TAT	CAT	AGG	TGT	3312
CCT	TTT	CTT	CTT	CCG	CTG	TTC	TAT	CAG	GAT	TCG	GAT	ACA	TAC	CAA	AAC	3360

CTG TAC GGG GCT ATA GCA CCA TCT TCG TCT ATC CCA ACT TTA CCT CTT	3408
CCC ACT TTG CCT GAT ACT ATA GAT TAT ATC ATT GAA GAT ATT GTG GGC	3456
GAG TAT GCT ACC CTT CTG GAG ACC ACA AAT CCA TTC AAG AAC ATA TTC	3504
GCA GAA ACT CCA TCA ACT ATG GAG CCT TCA AGA GCC AGC TTC AGT GAA	3552
GAT GAT AAT GAC GAA GAA GCG GAC CCT TCA AGC TTC AAA CCT GTC GCT	3600
TTT ACA GAA GAC AGA AAC CAC GAA AGG GAT AAC TAT GTT GTT GAT GTT	3648
TCA TAT ATT CTG TTG GAT GTC GAC CCG TTG CTT TTT ATT TTC GCT AAG	3696
AGT TTA TTA GAA CAG CTT TAC TCT GAA AAC ATG GTA CAA GTC TTA GAC	3744
GAT ATT GAA ATT GGG ATT GTG AAA CGA TTA AGC AAC CTT CAA GAA GGG	3792
ATC ACT TCT ATT TCA AAC ATT GAT ATC CAT ATT GCT TAT CTA AAT TTA	3840
ATC TGG CAA GAG ACA GGT GAG GAA GGT TTT GAG CTC TAT TTA GAT CGT	3888
ATT GAT TAT CAA ATG AGT GAA AAG TCT CTA GAG AAG AAC CGA ACA AAT	3936
AAA TTA TTA GAA GTA GCA GCT TTA GCA AAG GTA AAA ACT GTC AGA GTG	3984
ACT GTT AAC CAG AAG AAA AAT CCA GAC TTG TCT GAA GAT CGT CCC CCT	4032
GCA CTG TCG CTA GGG ATT GAG GGT TTC GAA GTA TGG TCT TCT ACA GAA	4080
GAT AGA CAA GTT AAC TCA TTA AAC TTA ACG TCA TCA GAT ATT ACC ATA	4128
GAC GAA TCT CAA ATG GAA TGG CTG TTT GAG TAC TGT AGT GAC CAG GGA	4176
AAT CTT ATT CAA GAG GTT TGC ACT TCT TTT AAT TCT ATT CAG AAC ACC	4224
AGA AGT AAT TCA AAG ACA GAA CTC ATT TCA AAG CTC ACA GCC GCA AGC	4272
GAA TAT TAT CAA ATT AGT CAT GAT CCT TAC GTC ATA ACA AAA CCT GCT	4320
TTT ATT ATG AGA CTT TCC AAA GGG CAT GTG CGT GAG AAT CGT AGT TGG	4368
AAA ATT ATT ACG CGT CTG AGA CAC ATT TTA ACG TAC CTT CCT GAT GAT	4416
TGG CAA AGC AAC ATC GAC GAA GTG CTA AAA GAA AAG AAA TAT ACC TCT	4464

GCT	AAA	GAT	GCA	AAA	AAT	ATC	TTC	ATG	TCT	GTG	TTT	TCG	ACT	TGG	AGA	4512
AAT	TGG	GAG	TTC	TCA	GAT	GTT	GCA	AGG	TCG	TAT	ATA	TAC	GGC	AAA	TTA	4560
TTC	ACG	GCA	GAA	AAT	GAG	AAA	CAT	AAA	CAA	AAT	TTG	ATT	AAA	AAA	TTG	4608
TTG	AAG	TGT	ACC	ATG	GGA	TCA	TTT	TAC	CTT	ACT	GTT	TAT	GGT	GAG	GGA	4656
TAT	GAG	GTT	GAG	CAT	AAT	TTT	GTT	GTT	GCG	GAT	GCC	AAT	CTG	GTA	GTG	4704
GAT	TTG	ACG	CCT	CCG	GTG	ACA	AGC	TTA	CCT	TCA	AAT	CGA	GAA	GAA	ACT	4752
ATT	GAA	ATT	ACG	GGA	AGA	GTA	GGC	TCA	GTA	AAA	GGA	AAA	TTC	AGT	GAT	4800
AGG	TTA	CTT	AAA	TTG	CAA	GAT	CTT	ATT	CCA	CTC	ATT	GCA	GCA	GTG	GGC	4848
GAA	GAT	GAC	AAA	AGT	GAT	CCA	AAA	AAG	GAG	TTA	TCA	AAG	CAA	TTC	AAA	4896
ATG	AAC	ACC	GTT	TTA	TTA	GTG	GAT	AAA	AGT	GAA	CTG	CAA	CTG	GTC	ATG	4944
GAC	CAA	ACG	AAG	CTG	ATG	AGT	AGA	ACA	GTT	GGG	GGT	AGA	GTT	AGT	TTA	4992
CTA	TGG	GAA	AAT	CTA	AAA	GAT	TCA	ACT	AGT	CAA	GCG	GGT	TCA	TTG	GTT	5040
ATA	TTT	TCC	CAG	AAA	TCG	GAA	GTG	TGG	TTA	AAA	CAC	ACA	TCT	GTC	ATT	5088
TTG	GGA	GAA	GCT	CAA	CTG	CGC	GAC	TTT	TCA	GTT	TTA	GCG	ACT	ACT	GAG	5136
GCA	TGG	TCA	CAC	AAG	CCT	ACG	ATT	CTG	ATA	AAC	AAC	CAG	TGC	GCA	GAT	5184
CTT	CAT	TTT	AGA	GCA	ATG	AGT	TCA	ACT	GAG	CAA	TTA	GTA	ACC	GCT	ATT	5232
ACT	GAA	ATT	AGG	GAA	AGT	CTG	ATG	ATG	ATT	AAA	GAG	CGC	ATA	AAG	TTT	5280
AAA	CCT	AAA	TCA	AAG	AAA	AAG	TCC	CAA	TTT	GTC	GAC	CAG	AAA	ATT	AAT	5328
ACA	GTC	TTG	TCA	TGT	TAT	TTT	TCA	AAC	GTT	AGT	TCT	GAA	GTT	ATG	CCG	5376
CTC	TCG	CCA	TTT	TAT	ATT	CGT	CAC	GAA	GCC	AAG	CAG	CTT	GAT	ATA	TAT	5424
TTT	AAC	AAA	TTC	GGT	TCA	AAT	GAG	ATT	TTG	TTA	AGC	ATA	TGG	GAT	ACT	5472
GAT	TTT	TTC	ATG	ACA	TCG	CAC	CAG	ACA	AAG	GAG	CAA	TAC	CTA	AGG	TTT	5520
TCA	TTT	GGC	GAT	ATT	GAA	ATT	AAA	GGA	GGA	ATT	TCT	AGA	GAA	GGC	TAT	5568

TCG	TTG	ATA	AAC	GTT	GAC	ATC	TCA	ATA	TCT	ATG	ATT	AAG	TTA	ACC	TTT	5616
TCG	GAG	CCG	CGC	CGT	ATT	GTA	AAC	AGT	TTT	TTA	CAA	GAT	GAA	AAG	CTT	5664
GCT	TCT	CAG	GGT	ATC	AAT	CTG	TTA	TAT	TCC	CTG	AAG	CCT	TTA	TTC	TTT	5712
AGT	TCA	AAT	CTA	CCA	AAA	AAA	GAG	AAG	CAG	GCA	CCC	TCG	ATA	ATG	ATA	5760
AAT	TGG	ACA	TTA	GAT	ACT	AGC	ATT	ACT	TAT	TTT	GGT	GTT	CTT	GTG	CCA	5808
GTG	GCT	TCC	ACG	TAT	TTC	GTG	TTT	GAA	TTA	CAT	ATG	CTG	CTA	CTT	TCT	5856
CTG	ACC	AAT	ACG	AAT	AAC	GGT	ATG	TTA	CCA	GAA	GAA	ACC	AAG	GTG	ACG	5904
GGA	CAG	TTT	TCC	ATC	GAA	AAC	ATC	CTA	TTT	CTA	ATA	AAG	GAG	CGG	TCA	5952
CTA	CCC	ATT	GGT	CTT	TCC	AAA	TTA	CTC	GAC	TTT	TCC	ATA	AAA	GTA	TCA	6000
ACC	CTA	CAA	AGA	ACG	GTT	GAT	ACG	GAG	CAG	TCA	TTC	CAA	GTG	GAA	AGT	6048
TCT	CAT	TTC	AGG	GTC	TGC	TTA	TCT	CCT	GAT	TCT	CTA	TTA	AGA	TTA	ATG	6096
TGG	GGC	GCG	CAT	AAA	TTG	CTA	GAC	TTG	AGC	CAT	TAC	TAT	TCA	AGA	CGC	6144
CAT	GCC	CCT	AAT	ATT	TGG	AAC	ACT	AAG	ATG	TTC	ACC	GGT	AAA	AGT	GAT	6192
AAG	TCA	AAA	GAA	ATG	CCC	ATA	AAT	TTC	CGT	TCA	ATA	CAC	ATC	CTG	TCC	6240
TAT	AAA	TTT	TGT	ATT	GGG	TGG	ATA	TTC	CAG	TAT	GGA	GCA	GGC	TCC	AAT	6288
CCT	GGG	TTA	ATG	TTA	GGT	TAT	AAC	AGA	TTG	TTT	TCA	GCA	TAT	GAA	AAG	6336
GAT	TTT	GGG	AAA	TTC	ACA	GTT	GTG	GAC	GCT	TTT	TTC	TCT	GTT	GCG	AAT	6384
GGT	AAT	ACC	TCA	AGC	ACT	TTT	TTC	TCT	GAA	GGA	AAC	GAG	AAA	GAC	AAA	6432
TAT	AAT	AGA	AGT	TTC	TTG	CCA	AAC	ATG	CAA	ATA	TCC	TAC	TGG	TTC	AAA	6480
AGA	TGT	GGT	GAG	TTG	AAA	GAT	TGG	TTT	TTT	AGA	TTT	CAT	GGT	GAA	GCA	6528
CTG	GAT	GTA	AAC	TTT	GTC	CCG	TCA	TTC	ATG	GAT	GTC	ATT	GAG	TCT	ACT	6576
TTA	CAA	TCC	ATG	CGA	GCA	TTT	CAA	GAG	CTG	AAA	AAG	AAC	ATT	CTG	GAT	6624
GTG	TCC	GAG	AGT	TTG	CGT	GCG	GAA	AAT	GAT	AAT	TCT	TAT	GCT	AGT	ACC	6672

AGT GTC GAA AGT GCT TCG AGT AGT TTG GCT CCC TTT CTC GAT AAC ATT	6720
AGA TCT GTT AAC TCA AAT TTC AAG TAT GAC GGT GGT GTA TTT AGG GTT	6768
TAC ACG TAC GAA GAT ATT GAA ACC AAG AGT GAG CCA TCT TTT GAA ATA	6816
AAA AGT CCA GTA GTC ACT ATA AAC TGT ACA TAT AAA CAT GAT GAA GAT	6864
AAA GTT AAG CCA CAT AAA TTC AGA ACA TTA ATC ACT GTC GAC CCA ACG	6912
CAT AAT ACT TTG TAT GCG GGA TGT GCT CCT TTA TTA ATG GAA TTT TCT	6960
GAA AGT CTG CAA AAG ATG ATA AAG AAA CAT AGC ACC GAC GAA AAA CCA	7008
AAC TTT ACA AAA CCT TCT TCA CAG AAT GTT GAT TAT AAG CGA CTT TTG	7056
GAT CAA TTT GAT GTG GCT GTA AAA CTA ACA TCA GCC AAG CAA CAG CTA	7104
AGT TTG AGC TGT GAA CCA AAA GCT AAG GTT CAG GCA GAT GTT GGA TTT	7152
GAA TCG TTT TTG TTC AGT ATG GCT ACC AAT GAG TTC GAC TCT GAA CAG	7200
CCT TTG GAG TTT TCT TTA ACT CTA GAA CAC ACA AAA GCG TCC ATT AAG	7248
CAC ATA TTT TCA AGA GAA GTA AGT ACG TCC TTT GAA GTT GGT TTC ATG	7296
GAC TTG ACG CTT TTA TTT ACA CAT CCT GAT GTA ATC AGT ATG TAT GGA	7344
ACG GGG TTG GTT TCT GAT CTA AGC GTC TTC TTC AAT GTA AAG CAG CTC	7392
CAG AAC CTG TAT TTA TTC TTG GAC ATA TGG AGG TTC AGT AGC ATT TTA	7440
CAC ACA CGG CCA GTG CAA AGA ACT GTT AAT AAG GAA ATT GAA ATG AGT	7488
TCA TTA ACA TCA ACC AAC TAT GCC GAT GCA GGT ACG GAA ATA CCC TGG	7536
TGC TTT ACA TTA ATT TTT ACA AAT GTT AGC GGA GAC GTT GAT TTG GGT	7584
CCT TCT CTC GGT ATG ATT TCA TTA AGG ACA CAA AGA ACA TGG CTG GCC	7632
ACA GAT CAT TAT AAC GAG AAG CGG CAG TTA CTG CAT GCT TTC ACT GAC	7680
GGT ATT AGC TTG ACA TCA GAA GGT AGA CTG AGT GGT TTA TTT GAA GTT	7728
GCG AAT GCA AGT TGG TTA TCA GAA GTA AAA TGG CCA CCT GAA AAA AGC	7776

AAA AAT ACT CAT CCA TTA GTT TCC ACC TCC CTG AAT ATT GAT GAT ATA	7824
GCG GTA AAG GCT GCT TTT GAT TAT CAT ATG TTC TTA ATC GGC ACT ATA	7872
AGT AAC ATA CAC TTC CAT CTT CAT AAT GAA AAG GAT GCC AAG GGG GTT	7920
CTA CCT GAT TTG CTG CAG GTC TCT TTT TCA TCA GAT GAA ATT ATC CTC	7968
AGC TCT ACT GCA TTA GTT GTA GCA AAT ATA CTG GAT ATC TAC AAC ACC	8016
ATT GTA CGT ATG AGG CAG GAT AAT AAA ATA TCG TAT ATG GAG ACG TTG	8064
AGA GAT TCC AAT CCT GGT GAA TCT AGG CAA CCA ATA TTA TAC AAA GAC	8112
ATT TTA AGA TCG CTG AAA TTA CTC AGA ACT GAT CTC TCG GTG AAT ATC	8160
TCC TCT TCA AAG GTC CAG ATT TCG CCA ATA TCT TTA TTC GAT GTG GAA	8208
GTG TTA GTA ATA AGA ATT GAC AAA GTC TCT ATA CGT TCC GAA ACA CAT	8256
TCG GGG AAA AAA TTA AAG ACA GAT TTG CAA CTA CAA GTT TTA GAT GTT	8304
TCT GCA GCG CTT TCT ACT TCC AAA GAA GAA TTA GAT GAG GAA GTT GGA	8352
GCT TCC ATT GCT ATT GAT GAT TAC ATG CAT TAT GCT TCC AAG ATT GTC	8400
GGT GGT ACT ATC ATT GAT ATT CCA AAA CTT GCT GTT CAT ATG ACA ACT	8448
TTA CAA GAA GAA AAG ACA AAT AAT TTA GAA TAT CTA TTT GCT TGC TCT	8496
TTT TCA GAC AAA ATA TCT GTA AGG TGG AAT CTA GGG CCT GTA GAC TTC	8544
ATA AAG GAA ATG TGG ACT ACA CAT GTC AAA GCA CTG GCA GTT CGT CGA	8592
TCC CAG GTA GCA AAT ATT TCC TTT GGA CAA ACT GAG GAA GAA CTT GAA	8640
GAA TCA ATT AAA AAG GAA GAA GCC GCT TCA AAG TTT AAT TAT ATT GCA	8688
CTA GAA GAA CCG CAG ATC GAA GTG CCT CAG ATA AGA GAT CTG GGA GAC	8736
GCC ACT CCA CCT ATG GAA TGG TTT GGT GTC AAT AGA AAA AAA TTT CCG	8784
AAA TTC ACT CAC CAA ACC GCA GTT ATC CCC GTC CAA AAG CTT GTT TAT	8832
CTT GCA GAA AAG CAG TAT GTC AAG ATA CTA GAT GAT ACG CAT	8874

(2) INFORMATION FOR SEQ ID NO: 2 :

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 2958 amino acids

(B) TYPE: amino acid

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(vi) ORIGINAL SOURCE:

(A) ORGANISM: *Saccharomyces cerevisiae*

(B) STRAIN: X2180-1B

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 2

Met Glu Ala Ile Ser Gln Leu Arg Gly Val Pro Leu Thr His Gln Lys
1 5 10 15
Asp Phe Ser Trp Val Phe Leu Val Asp Trp Ile Leu Thr Val Val Val
 20 25 30
Cys Leu Thr Met Ile Phe Tyr Met Gly Arg Ile Tyr Ala Tyr Leu Val
 35 40 45
Ser Phe Ile Leu Glu Trp Leu Leu Trp Lys Arg Ala Lys Ile Lys Ile
 50 55 60
Asn Val Glu Thr Leu Arg Val Ser Leu Leu Gly Gly Arg Ile His Phe
65 70 75 80
Lys Asn Leu Ser Val Ile His Lys Asp Tyr Thr Ile Ser Val Leu Glu
 85 90 95
Gly Ser Leu Thr Trp Lys Tyr Trp Leu Leu Asn Cys Arg Lys Ala Glu
 100 105 110
Leu Ile Glu Asn Asn Lys Ser Ser Ser Gly Lys Lys Ala Lys Leu Pro

115	120	125
Cys Lys Ile Ser Val Glu Cys Glu Gly Leu Glu Ile Phe Ile Tyr Asn		
130	135	140
Arg Thr Val Ala Tyr Asp Asn Val Ile Asn Leu Leu Ser Lys Asp Glu		
145	150	155
Arg Asp Lys Phe Glu Lys Tyr Leu Asn Glu His Ser Phe Pro Glu Pro		
165	170	175
Phe Ser Asp Gly Ser Ser Ala Asp Lys Leu Asp Glu Asp Leu Ser Glu		
180	185	190
Ser Ala Tyr Thr Thr Asn Ser Asp Ala Ser Ile Val Asn Asp Arg Asp		
195	200	205
Tyr Gln Glu Thr Asp Ile Gly Lys His Pro Lys Leu Leu Met Phe Leu		
210	215	220
Pro Ile Glu Leu Lys Phe Ser Arg Gly Ser Leu Leu Leu Gly Asn Lys		
225	230	235
Phe Thr Pro Ser Val Met Ile Leu Ser Tyr Glu Ser Gly Lys Gly Ile		
245	250	255
Ile Asp Val Leu Pro Pro Lys Glu Arg Leu Asp Leu Tyr Arg Asn Lys		
260	265	270
Thr Gln Met Glu Phe Lys Asn Phe Glu Ile Ser Ile Lys Gln Asn Ile		
275	280	285
Gly Tyr Asp Asp Ala Ile Gly Leu Lys Phe Lys Ile Asp Arg Gly Lys		
290	295	300

Val	Ser	Lys	Leu	Trp	Lys	Thr	Phe	Val	Arg	Val	Phe	Gln	Ile	Val	Thr
305					310					315					320
Lys	Pro	Val	Val	Pro	Lys	Lys	Thr	Lys	Lys	Ser	Ala	Gly	Thr	Ser	Asp
				325					330					335	
Asp	Asn	Phe	Tyr	His	Lys	Trp	Lys	Gly	Leu	Ser	Leu	Tyr	Lys	Ala	Ser
				340				345						350	
Ala	Gly	Asp	Ala	Lys	Ala	Ser	Asp	Leu	Asp	Asp	Val	Glu	Phe	Asp	Leu
		355					360					365			
Thr	Asn	His	Glu	Tyr	Ala	Lys	Phe	Thr	Ser	Ile	Leu	Lys	Cys	Pro	Lys
	370					375					380				
Val	Thr	Ile	Ala	Tyr	Asp	Val	Asp	Val	Pro	Gly	Val	Val	Pro	His	Gly
385					390					395					400
Ala	His	Pro	Thr	Ile	Pro	Asp	Ile	Asp	Gly	Pro	Asp	Val	Gly	Asn	Asn
				405					410					415	
Gly	Ala	Pro	Pro	Asp	Phe	Ala	Leu	Asp	Val	Gln	Ile	His	Gly	Gly	Ser
				420				425					430		
Ile	Cys	Tyr	Gly	Pro	Trp	Ala	Gln	Arg	Gln	Val	Ser	His	Leu	Gln	Arg
		435				440						445			
Val	Leu	Ser	Pro	Val	Val	Ser	Arg	Thr	Ala	Lys	Pro	Ile	Lys	Lys	Leu
	450					455						460			
Pro	Pro	Gly	Ser	Arg	Arg	Ile	Tyr	Thr	Leu	Phe	Arg	Met	Asn	Ile	Ser
465					470					475				480	
Ile	Met	Glu	Asp	Thr	Thr	Trp	Arg	Ile	Pro	Thr	Arg	Glu	Ser	Ser	Lys

485	490	495
Asp Pro Glu Phe Leu Lys His Tyr Lys Glu Thr Asn Glu Glu Tyr Arg		
500	505	510
Pro Phe Gly Trp Met Asp Leu Arg Phe Cys Lys Asp Thr Tyr Ala Asn		
515	520	525
Phe Asn Ile Ser Val Cys Pro Thr Val Gln Gly Phe Gln Asn Asn Phe		
530	535	540
His Val His Phe Leu Glu Thr Glu Ile Arg Ser Ser Val Asn His Asp		
545	550	555
Ile Leu Leu Lys Ser Lys Val Phe Asp Ile Asp Gly Asp Ile Gly Tyr		
565	570	575
Pro Leu Gly Trp Asn Ser Lys Ala Ile Trp Ile Ile Asn Met Lys Ser		
580	585	590
Glu Gln Leu Glu Ala Phe Leu Leu Arg Glu His Ile Thr Leu Val Ala		
595	600	605
Asp Thr Leu Ser Asp Phe Ser Ala Gly Asp Pro Thr Pro Tyr Glu Leu		
610	615	620
Phe Arg Pro Phe Val Tyr Lys Val Asn Trp Glu Met Glu Gly Tyr Ser		
625	630	635
Ile Tyr Leu Asn Val Asn Asp His Asn Ile Val Asn Asn Pro Leu Asp		
645	650	655
Phe Asn Glu Asn Cys Tyr Leu Ser Leu His Gly Asp Lys Leu Ser Ile		
660	665	670

Asp Val Thr Val Pro Arg Glu Ser Ile Leu Gly Thr Tyr Thr Asp Met			
675	680	685	
Ser Tyr Glu Ile Ser Thr Pro Met Phe Arg Met Met Leu Asn Thr Pro			
690	695	700	
Pro Trp Asn Thr Leu Asn Glu Phe Met Lys His Lys Glu Val Gly Arg			
705	710	715	720
Ala Tyr Asp Phe Thr Ile Lys Gly Ser Tyr Leu Leu Tyr Ser Glu Leu			
	725	730	735
Asp Ile Asp Asn Val Asp Thr Leu Val Ile Glu Cys Asn Ser Lys Ser			
	740	745	750
Thr Val Leu His Cys Tyr Gly Phe Val Met Arg Tyr Leu Thr Asn Val			
	755	760	765
Lys Met Asn Tyr Phe Gly Glu Phe Phe Asn Phe Val Thr Ser Glu Glu			
770	775	780	
Tyr Thr Gly Val Leu Gly Ala Arg Glu Val Gly Asp Val Thr Thr Lys			
785	790	795	800
Ser Ser Val Ala Asp Leu Ala Ser Thr Val Asp Ser Gly Tyr Gln Asn			
	805	810	815
Ser Ser Leu Lys Asn Glu Ser Glu Asp Lys Gly Pro Met Lys Arg Ser			
	820	825	830
Asp Leu Lys Arg Thr Thr Asn Glu Thr Asp Ile Trp Phe Thr Phe Ser			
	835	840	845
Val Trp Asp Gly Ala Leu Ile Leu Pro Glu Thr Ile Tyr Ser Phe Asp			

850	855	860
Pro Cys Ile Ala Leu His Phe Ala Glu Leu Val Val Asp Phe Arg Ser		
865	870	875
Cys Asn Tyr Tyr Met Asp Ile Met Ala Val Leu Asn Gly Thr Ser Ile		880
	885	890
		895
Lys Arg His Val Ser Lys Gln Ile Asn Glu Val Phe Asp Phe Ile Arg		
	900	905
		910
Arg Asn Asn Gly Ala Asp Glu Gln Glu His Gly Leu Leu Ser Asp Leu		
	915	920
		925
Thr Ile His Gly His Arg Met Tyr Gly Leu Pro Pro Thr Glu Pro Thr		
	930	935
		940
Tyr Phe Cys Gln Trp Asp Ile Asn Leu Gly Asp Leu Cys Ile Asp Ser		
945	950	955
		960
Asp Ile Glu Phe Ile Lys Gly Phe Phe Asn Ser Phe Tyr Lys Ile Gly		
	965	970
		975
Phe Gly Tyr Asn Asp Leu Glu Asn Ile Leu Leu Tyr Asp Thr Glu Thr		
	980	985
		990
Ile Asn Asp Met Thr Ser Leu Thr Val His Val Glu Lys Ile Arg Ile		
	995	1000
		1005
Gly Leu Lys Asp Pro Val Met Lys Ser Gln Ser Val Ile Ser Ala Glu		
	1010	1015
		1020
Ser Ile Leu Phe Thr Leu Ile Asp Phe Glu Asn Glu Lys Tyr Ser Gln		
1025	1030	1035
1040		

Arg Ile Asp Val Lys Ile Pro Lys Leu Thr Ile Ser Leu Asn Cys Val

1045

1050

1055

Met Gly Asp Gly Val Asp Thr Ser Phe Leu Lys Phe Glu Thr Lys Leu

1060

1065

1070

Arg Phe Thr Asn Phe Glu Gln Tyr Lys Asp Ile Asp Lys Lys Arg Ser

1075

1080

1085

Glu Gln Arg Arg Tyr Ile Thr Ile His Asp Ser Pro Tyr His Arg Cys

1090

1095

1100

Pro Phe Leu Leu Pro Leu Phe Tyr Gln Asp Ser Asp Thr Tyr Gln Asn

1105

1110

1115

1120

Leu Tyr Gly Ala Ile Ala Pro Ser Ser Ser Ile Pro Thr Leu Pro Leu

1125

1130

1135

Pro Thr Leu Pro Asp Thr Ile Asp Tyr Ile Ile Glu Asp Ile Val Gly

1140

1145

1150

Glu Tyr Ala Thr Leu Leu Glu Thr Thr Asn Pro Phe Lys Asn Ile Phe

1155

1160

1165

Ala Glu Thr Pro Ser Thr Met Glu Pro Ser Arg Ala Ser Phe Ser Glu

1170

1175

1180

Asp Asp Asn Asp Glu Glu Ala Asp Pro Ser Ser Phe Lys Pro Val Ala

1185

1190

1195

1200

Phe Thr Glu Asp Arg Asn His Glu Arg Asp Asn Tyr Val Val Asp Val

1205

1210

1215

Ser Tyr Ile Leu Leu Asp Val Asp Pro Leu Leu Phe Ile Phe Ala Lys

1220	1225	1230	
Ser Leu Leu Glu Gln Leu Tyr Ser Glu Asn Met Val Gln Val Leu Asp			
1235	1240	1245	
Asp Ile Glu Ile Gly Ile Val Lys Arg Leu Ser Asn Leu Gln Glu Gly			
1250	1255	1260	
Ile Thr Ser Ile Ser Asn Ile Asp Ile His Ile Ala Tyr Leu Asn Leu			
1265	1270	1275	1280
Ile Trp Gln Glu Thr Gly Glu Glu Gly Phe Glu Leu Tyr Leu Asp Arg			
1285	1290	1295	
Ile Asp Tyr Gln Met Ser Glu Lys Ser Leu Glu Lys Asn Arg Thr Asn			
1300	1305	1310	
Lys Leu Leu Glu Val Ala Ala Leu Ala Lys Val Lys Thr Val Arg Val			
1315	1320	1325	
Thr Val Asn Gln Lys Lys Asn Pro Asp Leu Ser Glu Asp Arg Pro Pro			
1330	1335	1340	
Ala Leu Ser Leu Gly Ile Glu Gly Phe Glu Val Trp Ser Ser Thr Glu			
1345	1350	1355	1360
Asp Arg Gln Val Asn Ser Leu Asn Leu Thr Ser Ser Asp Ile Thr Ile			
1365	1370	1375	
Asp Glu Ser Gln Met Glu Trp Leu Phe Glu Tyr Cys Ser Asp Gln Gly			
1380	1385	1390	
Asn Leu Ile Gln Glu Val Cys Thr Ser Phe Asn Ser Ile Gln Asn Thr			
1395	1400	1405	

Arg Ser Asn Ser Lys Thr Glu Leu Ile Ser Lys Leu Thr Ala Ala Ser

1410

1415

1420

Glu Tyr Tyr Gln Ile Ser His Asp Pro Tyr Val Ile Thr Lys Pro Ala

1425

1430

1435

1440

Phe Ile Met Arg Leu Ser Lys Gly His Val Arg Glu Asn Arg Ser Trp

1445

1450

1455

Lys Ile Ile Thr Arg Leu Arg His Ile Leu Thr Tyr Leu Pro Asp Asp

1460

1465

1470

Trp Gln Ser Asn Ile Asp Glu Val Leu Lys Glu Lys Lys Tyr Thr Ser

1475

1480

1485

Ala Lys Asp Ala Lys Asn Ile Phe Met Ser Val Phe Ser Thr Trp Arg

1490

1495

1500

Asn Trp Glu Phe Ser Asp Val Ala Arg Ser Tyr Ile Tyr Gly Lys Leu

1505

1510

1515

1520

Phe Thr Ala Glu Asn Glu Lys His Lys Gln Asn Leu Ile Lys Lys Leu

1525

1530

1535

Leu Lys Cys Thr Met Gly Ser Phe Tyr Leu Thr Val Tyr Gly Glu Gly

1540

1545

1550

Tyr Glu Val Glu His Asn Phe Val Val Ala Asp Ala Asn Leu Val Val

1555

1560

1565

Asp Leu Thr Pro Pro Val Thr Ser Leu Pro Ser Asn Arg Glu Glu Thr

1570

1575

1580

Ile Glu Ile Thr Gly Arg Val Gly Ser Val Lys Gly Lys Phe Ser Asp

1585	1590	1595	1600
Arg	Leu	Leu	Lys
Leu	Gln	Asp	Leu
Ile	Pro	Leu	Ile
Ala	Ala	Val	Gly
1605	1610	1615	
Glu	Asp	Asp	Lys
Ser	Asp	Pro	Lys
Lys	Lys	Glu	Leu
Ser	Lys	Gln	Phe
Lys			
1620	1625	1630	
Met	Asn	Thr	Val
Leu	Leu	Val	Asp
Lys	Ser	Glu	Leu
Gln	Leu	Val	Met
1635	1640	1645	
Asp	Gln	Thr	Lys
Leu	Met	Ser	Arg
Thr	Val	Gly	Gly
Arg	Val	Ser	Leu
1650	1655	1660	
Leu	Trp	Glu	Asn
Leu	Lys	Asp	Ser
Thr	Ser	Gln	Ala
Gly	Ser	Leu	Val
1665	1670	1675	1680
Ile	Phe	Ser	Gln
Lys	Ser	Glu	Val
Trp	Leu	Lys	His
Thr	Ser	Val	Ile
1685	1690	1695	
Leu	Gly	Glu	Ala
Gln	Leu	Arg	Asp
Phe	Ser	Val	Leu
Ala	Thr	Thr	Glu
1700	1705	1710	
Ala	Trp	Ser	His
Lys	Pro	Thr	Ile
Leu	Ile	Asn	Asn
Gln	Cys	Ala	Asp
1715	1720	1725	
Leu	His	Phe	Arg
Ala	Met	Ser	Ser
Thr	Glu	Gln	Leu
Val	Thr	Ala	Ile
1730	1735	1740	
Thr	Glu	Ile	Arg
Glu	Ser	Leu	Met
Met	Ile	Lys	Glu
Arg	Ile	Lys	Phe
1745	1750	1755	1760
Lys	Pro	Lys	Ser
Lys	Lys	Lys	Ser
Gln	Phe	Val	Asp
Gln	Lys	Ile	Asn
1765	1770	1775	

Thr Val Leu Ser Cys Tyr Phe Ser Asn Val Ser Ser Glu Val Met Pro			
1780	1785	1790	
Leu Ser Pro Phe Tyr Ile Arg His Glu Ala Lys Gln Leu Asp Ile Tyr			
1795	1800	1805	
Phe Asn Lys Phe Gly Ser Asn Glu Ile Leu Leu Ser Ile Trp Asp Thr			
1810	1815	1820	
Asp Phe Phe Met Thr Ser His Gln Thr Lys Glu Gln Tyr Leu Arg Phe			
1825	1830	1835	1840
Ser Phe Gly Asp Ile Glu Ile Lys Gly Gly Ile Ser Arg Glu Gly Tyr			
1845	1850	1855	
Ser Leu Ile Asn Val Asp Ile Ser Ile Ser Met Ile Lys Leu Thr Phe			
1860	1865	1870	
Ser Glu Pro Arg Arg Ile Val Asn Ser Phe Leu Gln Asp Glu Lys Leu			
1875	1880	1885	
Ala Ser Gln Gly Ile Asn Leu Leu Tyr Ser Leu Lys Pro Leu Phe Phe			
1890	1895	1900	
Ser Ser Asn Leu Pro Lys Lys Glu Lys Gln Ala Pro Ser Ile Met Ile			
1905	1910	1915	1920
Asn Trp Thr Leu Asp Thr Ser Ile Thr Tyr Phe Gly Val Leu Val Pro			
1925	1930	1935	
Val Ala Ser Thr Tyr Phe Val Phe Glu Leu His Met Leu Leu Leu Ser			
1940	1945	1950	
Leu Thr Asn Thr Asn Asn Gly Met Leu Pro Glu Glu Thr Lys Val Thr			
1955	1960	1965	

Gly Gln Phe Ser Ile Glu Asn Ile Leu Phe Leu Ile Lys Glu Arg Ser															
1970				1975				1980							
Leu Pro Ile Gly Leu Ser Lys Leu Leu Asp Phe Ser Ile Lys Val Ser															
1985				1990				1995				2000			
Thr Leu Gln Arg Thr Val Asp Thr Glu Gln Ser Phe Gln Val Glu Ser															
				2005				2010				2015			
Ser His Phe Arg Val Cys Leu Ser Pro Asp Ser Leu Leu Arg Leu Met															
				2020				2025				2030			
Trp Gly Ala His Lys Leu Leu Asp Leu Ser His Tyr Tyr Ser Arg Arg															
				2035				2040				2045			
His Ala Pro Asn Ile Trp Asn Thr Lys Met Phe Thr Gly Lys Ser Asp															
2050				2055				2060							
Lys Ser Lys Glu Met Pro Ile Asn Phe Arg Ser Ile His Ile Leu Ser															
2065				2070				2075				2080			
Tyr Lys Phe Cys Ile Gly Trp Ile Phe Gln Tyr Gly Ala Gly Ser Asn															
				2085				2090				2095			
Pro Gly Leu Met Leu Gly Tyr Asn Arg Leu Phe Ser Ala Tyr Glu Lys															
				2100				2105				2110			
Asp Phe Gly Lys Phe Thr Val Val Asp Ala Phe Phe Ser Val Ala Asn															
2115				2120				2125							
Gly Asn Thr Ser Ser Thr Phe Phe Ser Glu Gly Asn Glu Lys Asp Lys															
2130				2135				2140							
Tyr Asn Arg Ser Phe Leu Pro Asn Met Gln Ile Ser Tyr Trp Phe Lys															

2145	2150	2155	2160
Arg Cys Gly Glu Leu Lys Asp Trp Phe Phe Arg Phe His Gly Glu Ala			
2165	2170	2175	
Leu Asp Val Asn Phe Val Pro Ser Phe Met Asp Val Ile Glu Ser Thr			
2180	2185	2190	
Leu Gln Ser Met Arg Ala Phe Gln Glu Leu Lys Lys Asn Ile Leu Asp			
2195	2200	2205	
Val Ser Glu Ser Leu Arg Ala Glu Asn Asp Asn Ser Tyr Ala Ser Thr			
2210	2215	2220	
Ser Val Glu Ser Ala Ser Ser Ser Leu Ala Pro Phe Leu Asp Asn Ile			
2225	2230	2235	2240
Arg Ser Val Asn Ser Asn Phe Lys Tyr Asp Gly Gly Val Phe Arg Val			
2245	2250	2255	
Tyr Thr Tyr Glu Asp Ile Glu Thr Lys Ser Glu Pro Ser Phe Glu Ile			
2260	2265	2270	
Lys Ser Pro Val Val Thr Ile Asn Cys Thr Tyr Lys His Asp Glu Asp			
2275	2280	2285	
Lys Val Lys Pro His Lys Phe Arg Thr Leu Ile Thr Val Asp Pro Thr			
2290	2295	2300	
His Asn Thr Leu Tyr Ala Gly Cys Ala Pro Leu Leu Met Glu Phe Ser			
2305	2310	2315	2320
Glu Ser Leu Gln Lys Met Ile Lys Lys His Ser Thr Asp Glu Lys Pro			
2325	2330	2335	

Asn Phe Thr Lys Pro Ser Ser Gln Asn Val Asp Tyr Lys Arg Leu Leu

2340

2345

2350

Asp Gln Phe Asp Val Ala Val Lys Leu Thr Ser Ala Lys Gln Gln Leu

2355

2360

2365

Ser Leu Ser Cys Glu Pro Lys Ala Lys Val Gln Ala Asp Val Gly Phe

2370

2375

2380

Glu Ser Phe Leu Phe Ser Met Ala Thr Asn Glu Phe Asp Ser Glu Gln

2385

2390

2395

2400

Pro Leu Glu Phe Ser Leu Thr Leu Glu His Thr Lys Ala Ser Ile Lys

2405

2410

2415

His Ile Phe Ser Arg Glu Val Ser Thr Ser Phe Glu Val Gly Phe Met

2420

2425

2430

Asp Leu Thr Leu Leu Phe Thr His Pro Asp Val Ile Ser Met Tyr Gly

2435

2440

2445

Thr Gly Leu Val Ser Asp Leu Ser Val Phe Phe Asn Val Lys Gln Leu

2450

2455

2460

Gln Asn Leu Tyr Leu Phe Leu Asp Ile Trp Arg Phe Ser Ser Ile Leu

2465

2470

2475

2480

His Thr Arg Pro Val Gln Arg Thr Val Asn Lys Glu Ile Glu Met Ser

2485

2490

2495

Ser Leu Thr Ser Thr Asn Tyr Ala Asp Ala Gly Thr Glu Ile Pro Trp

2500

2505

2510

Cys Phe Thr Leu Ile Phe Thr Asn Val Ser Gly Asp Val Asp Leu Gly

2515	2520	2525
Pro Ser Leu Gly Met Ile Ser Leu Arg Thr Gln Arg Thr Trp Leu Ala		
2530	2535	2540
Thr Asp His Tyr Asn Glu Lys Arg Gln Leu Leu His Ala Phe Thr Asp		
2545	2550	2555
Gly Ile Ser Leu Thr Ser Glu Gly Arg Leu Ser Gly Leu Phe Glu Val		
2565	2570	2575
Ala Asn Ala Ser Trp Leu Ser Glu Val Lys Trp Pro Pro Glu Lys Ser		
2580	2585	2590
Lys Asn Thr His Pro Leu Val Ser Thr Ser Leu Asn Ile Asp Asp Ile		
2595	2600	2605
Ala Val Lys Ala Ala Phe Asp Tyr His Met Phe Leu Ile Gly Thr Ile		
2610	2615	2620
Ser Asn Ile His Phe His Leu His Asn Glu Lys Asp Ala Lys Gly Val		
2625	2630	2635
Leu Pro Asp Leu Leu Gln Val Ser Phe Ser Ser Asp Glu Ile Ile Leu		
2645	2650	2655
Ser Ser Thr Ala Leu Val Val Ala Asn Ile Leu Asp Ile Tyr Asn Thr		
2660	2665	2670
Ile Val Arg Met Arg Gln Asp Asn Lys Ile Ser Tyr Met Glu Thr Leu		
2675	2680	2685
Arg Asp Ser Asn Pro Gly Glu Ser Arg Gln Pro Ile Leu Tyr Lys Asp		
2690	2695	2700

Ile	Leu	Arg	Ser	Leu	Lys	Leu	Leu	Arg	Thr	Asp	Leu	Ser	Val	Asn	Ile
2705						2710					2715				2720
Ser	Ser	Ser	Lys	Val	Gln	Ile	Ser	Pro	Ile	Ser	Leu	Phe	Asp	Val	Glu
				2725						2730				2735	
Val	Leu	Val	Ile	Arg	Ile	Asp	Lys	Val	Ser	Ile	Arg	Ser	Glu	Thr	His
				2740						2745				2750	
Ser	Gly	Lys	Lys	Leu	Lys	Thr	Asp	Leu	Gln	Leu	Gln	Val	Leu	Asp	Val
		2755						2760					2765		
Ser	Ala	Ala	Leu	Ser	Thr	Ser	Lys	Glu	Glu	Leu	Asp	Glu	Glu	Val	Gly
		2770					2775						2780		
Ala	Ser	Ile	Ala	Ile	Asp	Asp	Tyr	Met	His	Tyr	Ala	Ser	Lys	Ile	Val
2785						2790					2795				2800
Gly	Gly	Thr	Ile	Ile	Asp	Ile	Pro	Lys	Leu	Ala	Val	His	Met	Thr	Thr
						2805					2810				2815
Leu	Gln	Glu	Glu	Lys	Thr	Asn	Asn	Leu	Glu	Tyr	Leu	Phe	Ala	Cys	Ser
						2820					2825			2830	
Phe	Ser	Asp	Lys	Ile	Ser	Val	Arg	Trp	Asn	Leu	Gly	Pro	Val	Asp	Phe
				2835						2840				2845	
Ile	Lys	Glu	Met	Trp	Thr	Thr	His	Val	Lys	Ala	Leu	Ala	Val	Arg	Arg
		2850								2855				2860	
Ser	Gln	Val	Ala	Asn	Ile	Ser	Phe	Gly	Gln	Thr	Glu	Glu	Glu	Leu	Glu
2865							2870						2875		2880
Glu	Ser	Ile	Lys	Lys	Glu	Glu	Ala	Ala	Ser	Lys	Phe	Asn	Tyr	Ile	Ala

2885

2890

2895

Leu Glu Glu Pro Gln Ile Glu Val Pro Gln Ile Arg Asp Leu Gly Asp

2900

2905

2910

Ala Thr Pro Pro Met Glu Trp Phe Gly Val Asn Arg Lys Lys Phe Pro

2915

2920

2925

Lys Phe Thr His Gln Thr Ala Val Ile Pro Val Gln Lys Leu Val Tyr

2930

2935

2940

Leu Ala Glu Lys Gln Tyr Val Lys Ile Leu Asp Asp Thr His

2945

2950

2955